Teratological Legs in Lepidoptera. (*With Plate II.*)

By E. A. COCKAYNE, M.D., F.R.C.P., F.E.S.

Descriptions of abnormalities in the structure of the legs of Lepidoptera are few in number. It is probable that they are rarer than in Coleoptera, in which the legs are more exposed to injury during the pupal period. But frequently they must be overlooked, owing to the fact that they are concealed by the wings, by the long hair on the abdomen, and by their own covering of scales. Specimens of *Smerinthus ocellatus* and *Plusia iota*, each with an extra leg, have been described by Schultz and Bleuse. An extra tarsus has been recorded in *Cosmotriche potatoria* by Barrett, in *Catocala nupta* by Chapman, in *Parnassius apollo* by Bleuse, and in *Ocneria dispar* by Forbush and Fernald. A *Zygaena anthyllidis* described by Chapman affords the only example of reduplication in a lepidopterous leg which follows Bateson's Law. It has three tarsi on the left meta-thoracic leg, the two extra ones being arranged in secondary symmetry. Although the abnormalities, which I am describing below, are not so striking, I think they are different from any previously noted. They include a tarsus with the terminal joint double, tarsi with three claws, and a tarsus with the claws partially fused at the base, but ending in three and five tips respectively.

Apocheima hispidaria.—Female. Loughton, bred from a full grown wild larva. II., 1923. The tarsus of the left metathoracic leg is very short, measuring only 1mm., the corresponding tarsus on the right side being 3·75mm. long. It has only three joints, the second of which bifurcates at the distal end. From the anterior, or internal portion, arises a terminal joint with two small claws and paronychia. From the posterior or external portion, which is more heavily chitinised, arises a thinner, longer joint formed of very weak chitin, and devoid of claws, pulvillus, and all the other structures which form the foot. Fig. 1.

Lasiocampa trifolii.—Female. S. Cornwall. Bred IX., 1923.

The right prothoracic leg has a five-jointed tarsus 4mm. instead of 5mm. long. The terminal joint bears three claws. The plate, from which the pulvillus springs, is abnormal in shape and lies toward the outer side. The outer paronychium is small, and is very nearly in the usual position, but the one on the inner aspect is further out than usual, and is separated from the plate of the pulvillus by a piece of smooth chitin. The pulvillus itself, well formed, of black and polished chitin, is displaced outwards. Of the three claws the central one is obviously supernumerary, but bears no appearance of being double. The outer one, on the other hand, is very wide, and may be a fused double one. If so the specimen may conform to Bateson's Law. The inner half of this claw may be a mirror image of the outer, and each may represent a complete claw, whereas the central claw may be a mirror image of the inner half of the double claw. The two last would be supernumerary. The long bristle of the empodium is present, but is omitted from the figure. Many spines are absent from the ventral surface of the last joint of the tarsus. Figs. 2 and 3.

Lycia hirtaria.—Female. London.

From a family of inbred larvae, many of which produced weak,

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crippled imagines. The tarsus of the right prothoracic leg has only two joints, and measures 1mm. in length instead of 3·25mm. It has on the last joint a small narrow pulvillus, two small paronychia, two lateral claws and a third abnormally broad claw lying almost midway between and a little dorsal to them. Its tip is bent upwards. Its width makes it probable that it is a fused double claw. If so, this may be regarded as an example of Bateson's Law. The distal extremity of the last tarsal joint is slightly longer on the inner and wider on the outer side, and the latter is probably the side on which reduplication has occurred. The outer part of the double claw may be a mirror image of the external lateral claw and the inner part of a mirror image of the outer.

The external lateral claw would be the original claw and the double central claw would represent the two extra ones. In addition to the tarsus the tibia of this leg is short, being 2mm. instead of 3·25mm. long. Figs. 6 and 7.

Lasiocampa trifolii.—Female. S. Cornwall. Bred IX., 1923.

The right prothoracic tarsus is very small, being 1mm. in length, and has only two joints. The terminal joint is so abnormal that I cannot identify the different parts. There appears to be one minute paronychium, but the other one and the pulvillus are absent. It ends in a most peculiar single claw, which terminates in a sharp point and a small blunt process, and has another sharp pointed process projecting from it laterally.

There was another dense chitinous process arising from the ventral aspect of the last joint at a point much nearer to the base. Thin at its origin it became swollen distally, and the swollen part was deeply grooved and ended in two sharp points. I made a drawing of it in the dry state, but broke it off and lost it when making a microscopical preparation. Apparently there are two claws, one bifid or trifid and the other bifid. The penultimate joint of the tarsus has only three spines. Figs. 8 and 9.

Apocheima hispidaria.—Female. Buddon Wood. W. G. Blatch-22.III.1895. Canon C. T. Cruttwell's collection.

Of the six legs four have abnormal tarsi. The left prothoracic tarsus terminates in two large normal claws, but it has only three joints, and measures 1·75mm. in length. The left mesothoracic tarsus measures 2mm., has four joints, and ends in a normal foot. The left mesothoracic leg has a tarsus 1·8mm. long, with four joints The claws are fused for about one-third of their length and do not diverge in the usual way. A lateral view shows that the posterior or internal claw is partially separated into three by deep groöves and terminates in three distinct tips, an upper, a middle, and a lower one. (Fig. 4.) The external or anterior claw is also partly divided by a groove. The upper part ends in a sharp tip turned inwards at right angles, and the lower part ends in four separate tips, three of which are bent inwards. (Fig. 5.) The normal claws in this species are much longer, quite separate, and each ends in a single sharp point turned outwards and downwards. The spines on the penultimate joint of this abnormal tarsus are reduced in number to three. The right metathoracic leg has a tarsus with four joints, measuring 1·75mm. The last three joints are very short. The penultimate has a rounded lateral outgrowth, and the last a dorsal outgrowth ending in two sharp pointed pieces of chitin projecting over the spines. The remaining two legs are normal with tarsi between 3 and 4mm. long.

Lasiocampa trifolii.—Female.

The left prothoracic leg has a tarsus with four joints, the last three being very short. It has two small but perfect claws. Its length is 3mm., that of the corresponding tarsus on the right side being 5mm.

Apocheima hispidaria.—Female.

The left metathoracic leg has a four-jointed tarsus 3mm. instead of 4mm. long, and the right prothoracic leg has a three-jointed tarsus 2mm. instead of 4mm long.

A. hispidaria.—Female.

The right mesothoracic leg has a three-jointed tarsus slightly more than 1mm. in length.

A. hispidaria.—Female.

The tibia of the left mesothoracic leg measures 1·5mm. instead of 3mm. in length. The tarsus is normal.

L. trifolii.—Female.

The left prothoracic leg has single-jointed tarsus devoid of scales, spines, claws, pulvillus and paronychia.

Lycia hirtaria.—Female.

The right mesothoracic tarsus has five joints but is 3 instead of 4mm. long.

L. hirtaria.—Female.

The left metathoracic tarsus has five joints, but is half a millimetre shorter than the right.

L. hirtaria.—Female.

The left mesothoracic tarsus has only four joints and one claw is missing.

Xanthia ocellaris.—H. Worsley-Wood. Thames Valley.

The right prothoracic tarsus has only two joints and measures 1·5mm. instead of 4mm. All the structures on the terminal joint are present but much reduced in size.

Erannis defoliaria.—Female.

The left prothoracic leg has a very thin four-jointed tarsus without scales or claws.

Fidonia atomaria.—Male. Bred L. W. Newman. X. 1910. Dr. Chapman's teratological collection.

The right prothoracic leg is very small but perfect. The following are the measurements of the two legs in millimetres. R. femur, 1·1, L. 2·4 ; R. tibia ·5, L. 1·8 ; Epiphysis of R. tibia ·3, L. 1·1 ; Tarsal joints R. ·9, ·5, ·36, ·24, ·4, with claws, L. 1·3, ·6, ·5, ·3, ·52. From them it will be seen that the greatest reduction in length has occurred in the tibia and femur.

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Bleuse.—*Bull de la Soc. Ent. de France*, 1900, p. 52.

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Forbush and Fernald.—*The Gypsy Moth.* Report of Massachusetts Board of Agriculture, 1896, p. 341, pl. li., fig. 8.

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[*Melitae maturna.*—" Among the specimens taken by Mr. Fison in the Engadine, in 1901, is a most remarkable ♂, in which the middle left leg is replaced by a tiny wing, having the appearance of the inner margin of a hindwing with the fringe, about 8mm. in length and 2mm. in breadth. It is quite detached from the normal wing, which is per-

fect without it. It is more curious, as the leg is a true limb, which the wing structures, correctly speaking, are not."—G.W.]

New British Cecidomyiidae. 5.

By RICHARD S. BAGNALL, F.L.S., F.R.S.Ed., F.E.S., and J. W. HESLOP HARRISON, D.Sc., F.R.S.Ed.

(*Continued from Vol. XXXIV., p. 154.*)

The present lengthy list of additions to the British Fauna is due to the unequalled opportunities we have had this year of working districts producing plants, either new to us or not previously accessible in any quantity. In particular, our visits to Shropshire and to Blakeney Point were exceptionally profitable; on the contrary, much hard work was done in the Norfolk Broads with a minimum of success. Equally noteworthy was the detection, at points well worked by us in the past, of such species as *Rhopalomyia baccarum*, *Contarinia fagi* and *C. pisi*.

All of this demonstrates that much remains to reward the labours of Cecidologists in the British Isles.

Clinorrhyncha tanaceticola, K.

Affecting achenes of *Tanacetum*.

Shropshire, near Cross House, October, 1923.

Prolasioptera cerealis, Lind.

On various grasses and cereals, a depression in the stem containing a yellowish orange larva, concealed under a shining black "scale" or "lid."

Durham, Gibside, on *Avena*, *Agropyrum* and *Dactylis*. Also other records.

Lasioptera populnea, Wachtl.

A leaf pustule greater in diameter and less convex, or rather of less depth, than that of *Harmandia pustulans*.

Shropshire, Pulley Common, near Shrewsbury, on *Populus tremula*, October, 1923. Rare.

Rhopalomyia baccarum, Wachtl.

On *Artemisia vulgaris*. Prominent spherical gall, chiefly situated at the roots.

Durham, Birtley and Lamesley, August, 1923. the midge just emerging. Rarer than in 1922, when it abounded in September and October.

Stenospatha eriophori, K.

Pale pinkish to orange-yellow larvae, in the leaf-sheath of cotton grass (*Eriophorum* spp.).

Scotland, Bavelaw Moss, September, 1922.

Shropshire and Cheshire, Whixall Moss near Ellesmere, October, 1903.